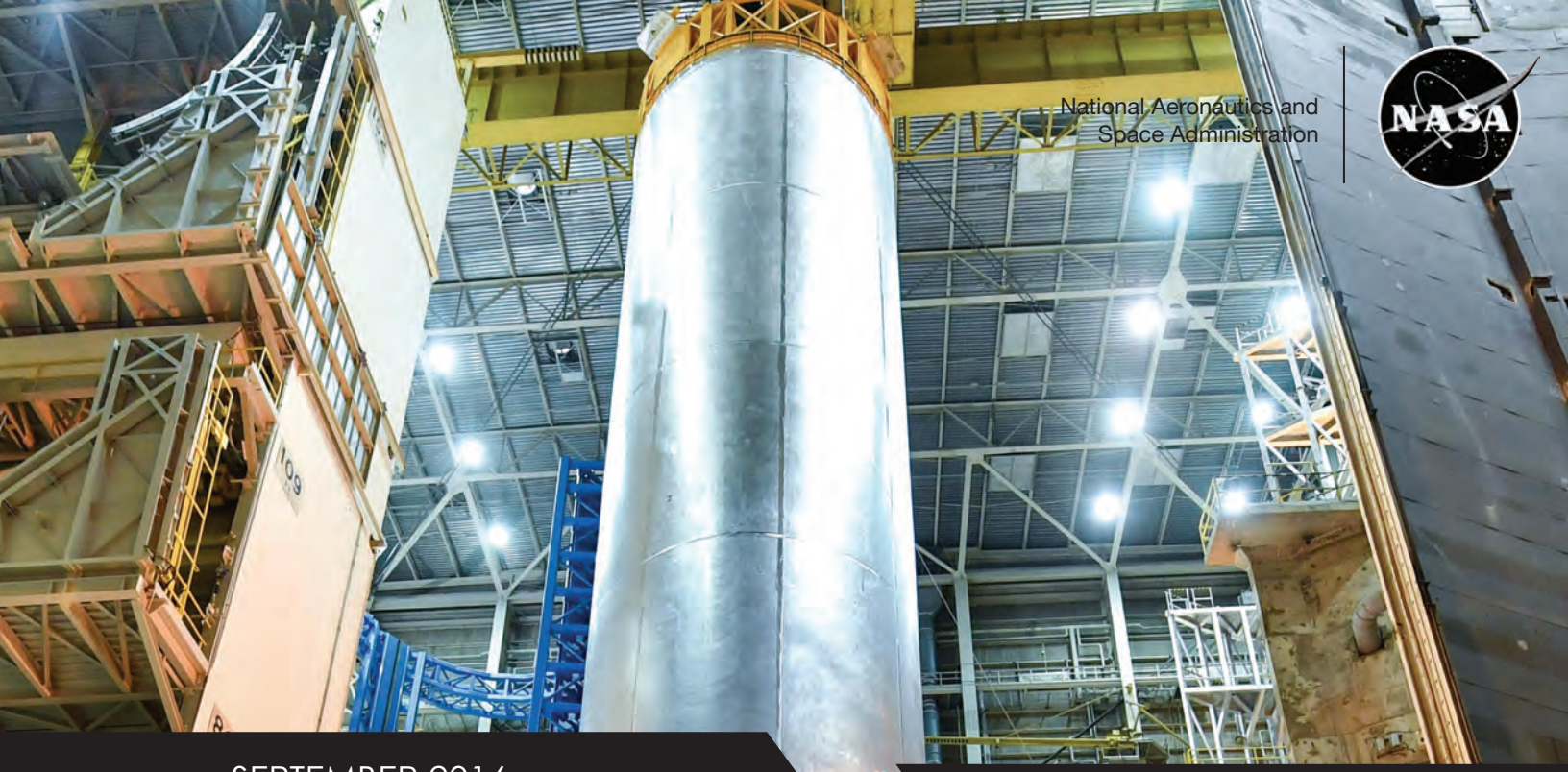


National Aeronautics and Space Administration

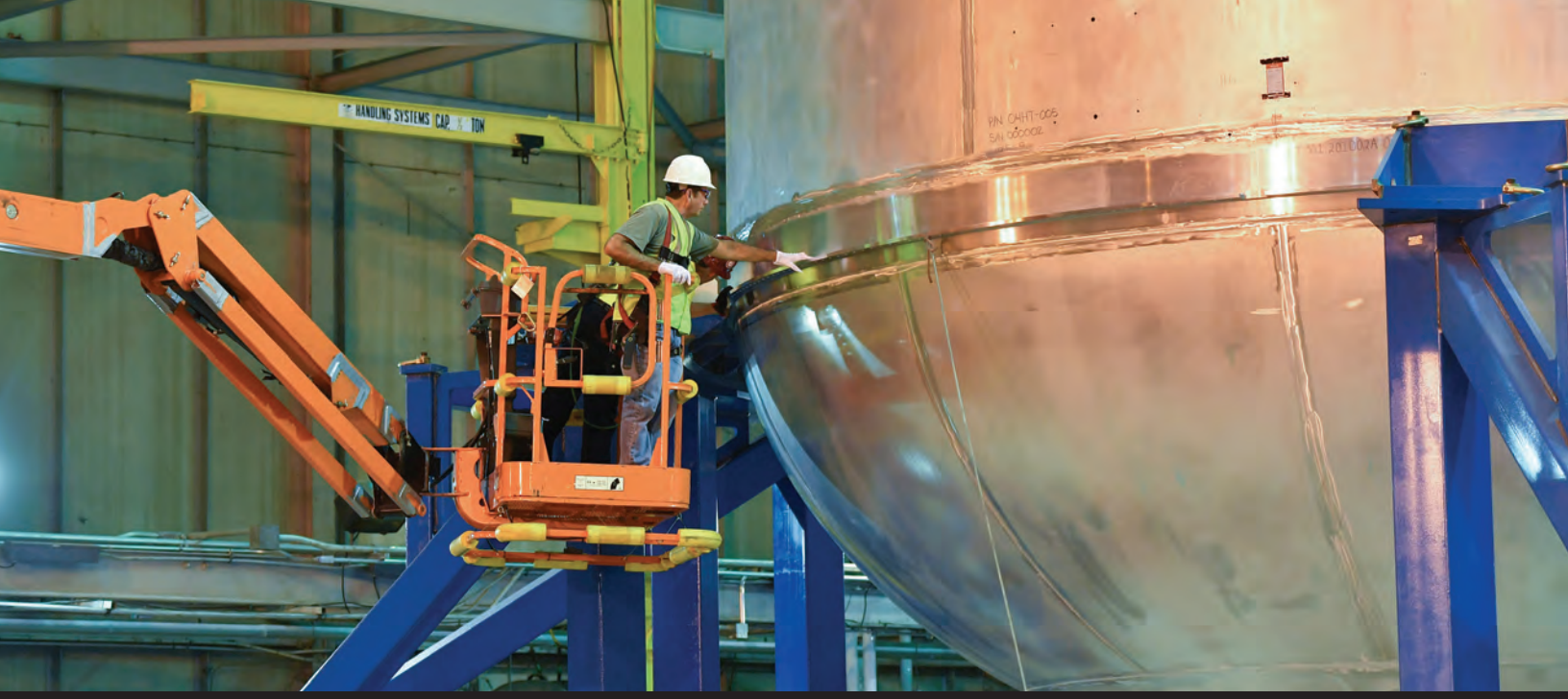
NASA

SEPTEMBER 2016

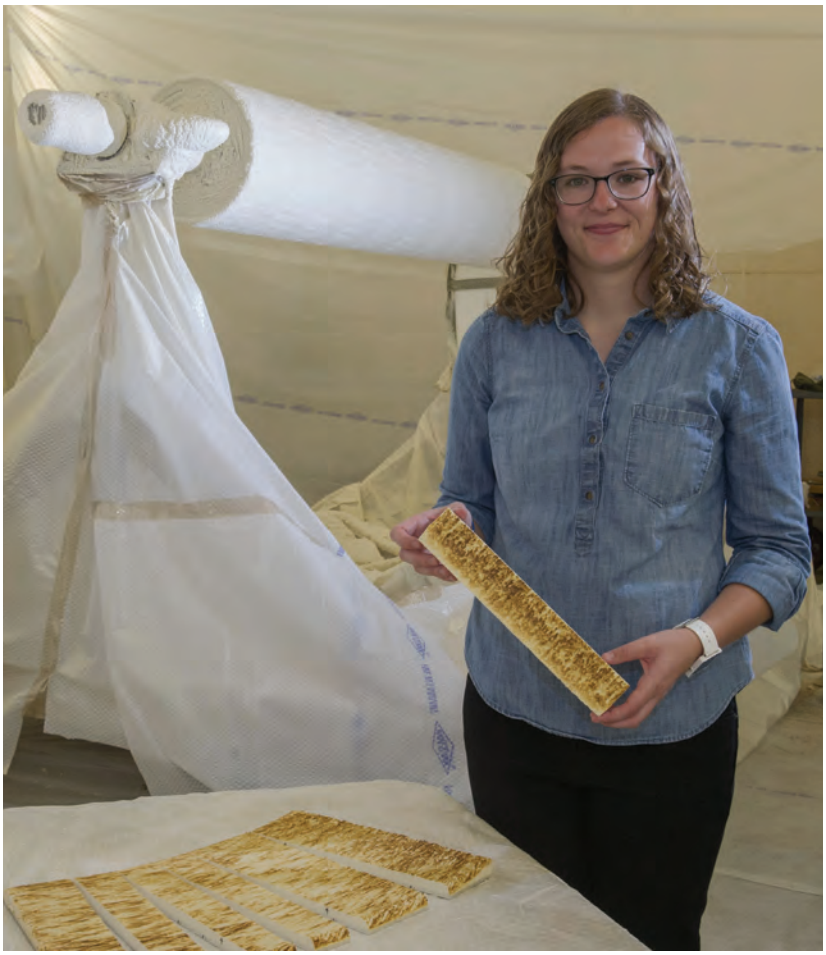
SPACE LAUNCH SYSTEM HIGHLIGHTS

FLIGHT HARDWARE COMPLETES WELDING AT MICHOUD

www.nasa.gov



Welding is complete on the largest piece of the core stage that will provide the fuel for the first flight of SLS with the Orion spacecraft in 2018. The core stage liquid hydrogen tank has completed welding on the Vertical Assembly Center at NASA's Michoud Assembly Facility in New Orleans. Standing at 130 feet tall, the liquid hydrogen tank is the largest cryogenic fuel tanks for a rocket in the world. The liquid hydrogen tank and liquid oxygen tank are part of the core stage. Together, the tanks will hold 733,000 gallons of propellant and feed the vehicle's four RS-25 engines to produce a total of 2 million pounds of thrust. This is the second major piece of core stage flight hardware to finish full welding on the Vertical Assembly Center. The core stage flight engine section completed welding in April. More than 1.7 miles of welds have been completed for core stage hardware at Michoud. How is the core stage built? **Find out more at: bit.ly/2cQrd2F**

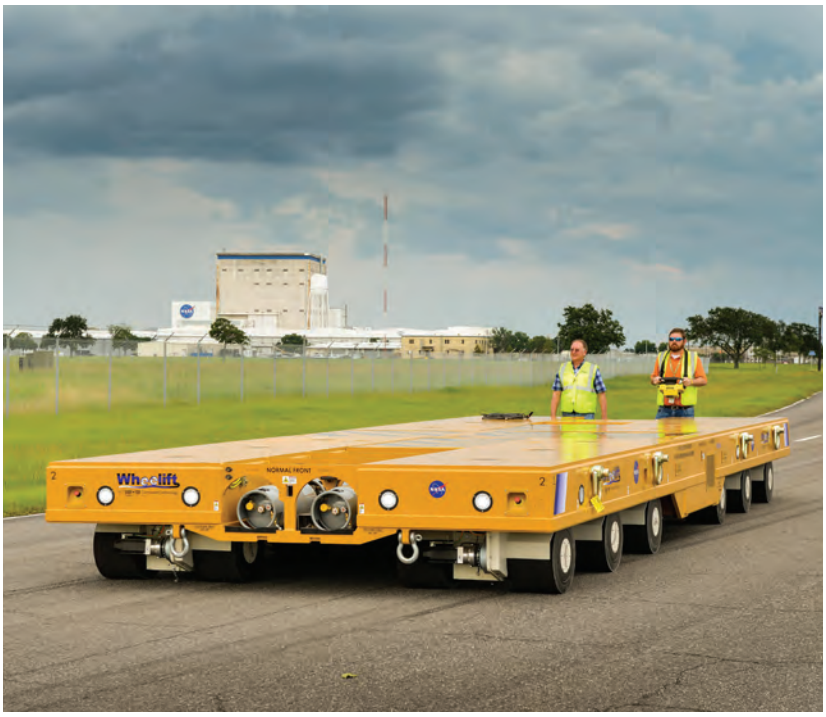


NASA TESTS NEW INSULATION FOR SLS ROCKET

Amy Buck, SLS core stage insight lead at NASA's Marshall Space Flight Center in Huntsville, Alabama, holds up a sample of foam that recently went through testing in Marshall's Hot Gas Facility. The facility is used for development and qualification of material systems for use on launch vehicles, like SLS. These foam panels were tested to determine recession characteristics of the foam during the ascent phase of flight. The surface of the foam reaches more than 500 degrees Fahrenheit as it undergoes a hot gas flow at speeds of up to Mach 4 to simulate the environment during launch. NASA engineers then take the samples and measure how much foam is lost during the test to characterize the materials for use in the launch vehicle design and analysis. **Read the full story at: bit.ly/2dYmCR2**

FACES OF SLS: JONATHAN LOOSER

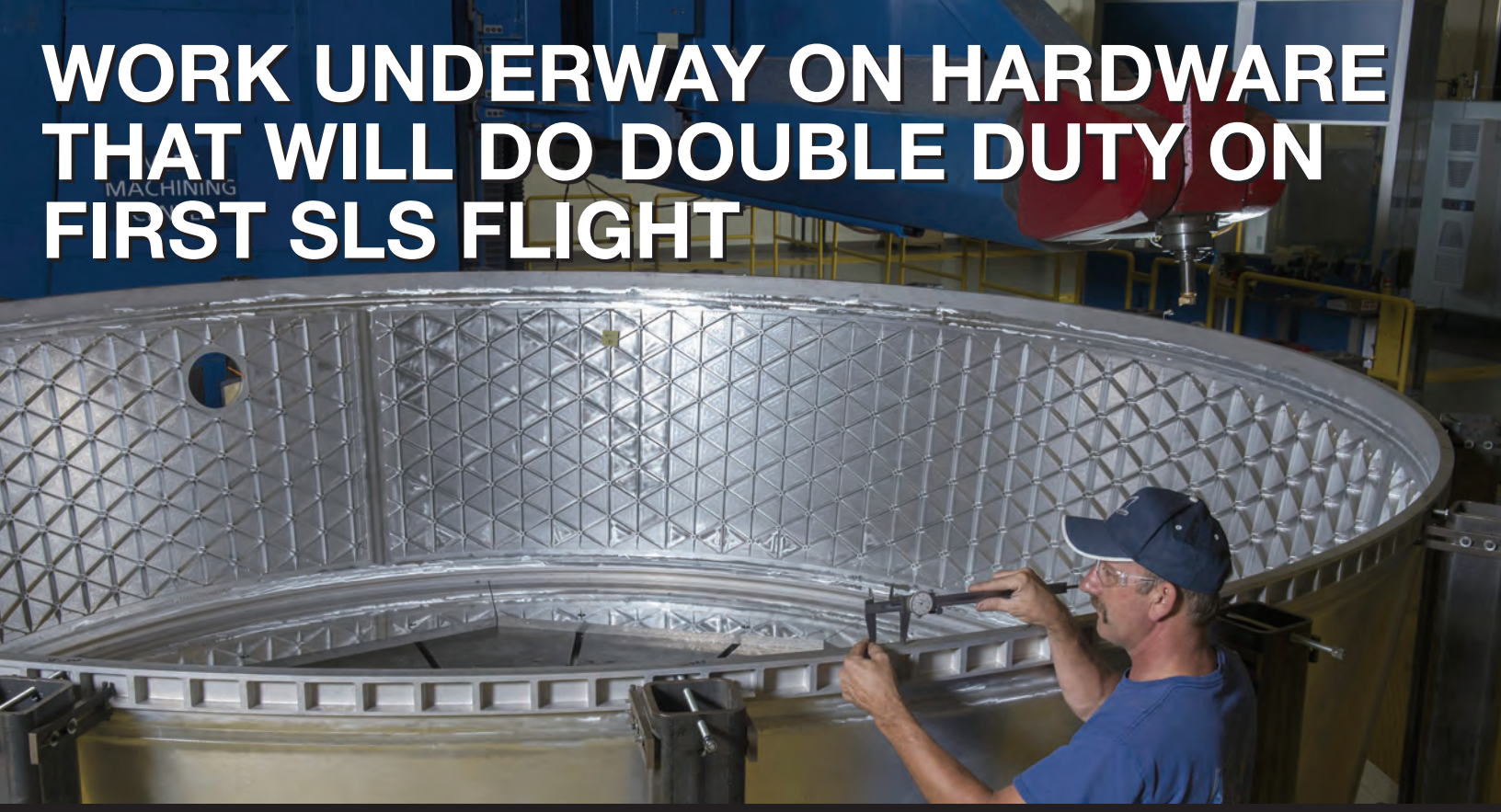
An interest in math and science led this NASA engineer to an exciting career of working on the powerful propulsion for NASA's deep-space rocket, SLS. Meet Jonathan Looser, SLS core stage propulsion lead at NASA's Marshall Space Flight Center in Huntsville, Alabama.



SPECIALIZED TRANSPORTERS MOVE CORE STAGE OF SLS

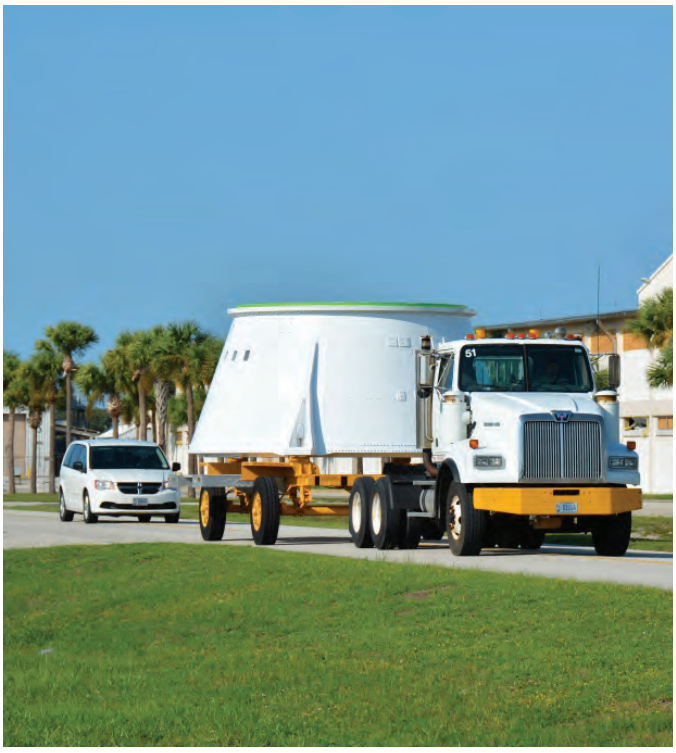
Four transporters were delivered to NASA's Michoud Assembly Facility in New Orleans where the five sections that make up the core stage are being manufactured. The transporters were designed and built by Wheelift of Waterloo, Iowa, where they were named Elpis, Novus, Pandora and Aegis through a company-hosted contest. The transporters will carry the core stage down roads and on and off the Pegasus barge for shipping to test and launch sites. **Read the full story at: bit.ly/2dH71pR**

WORK UNDERWAY ON HARDWARE THAT WILL DO DOUBLE DUTY ON FIRST SLS FLIGHT



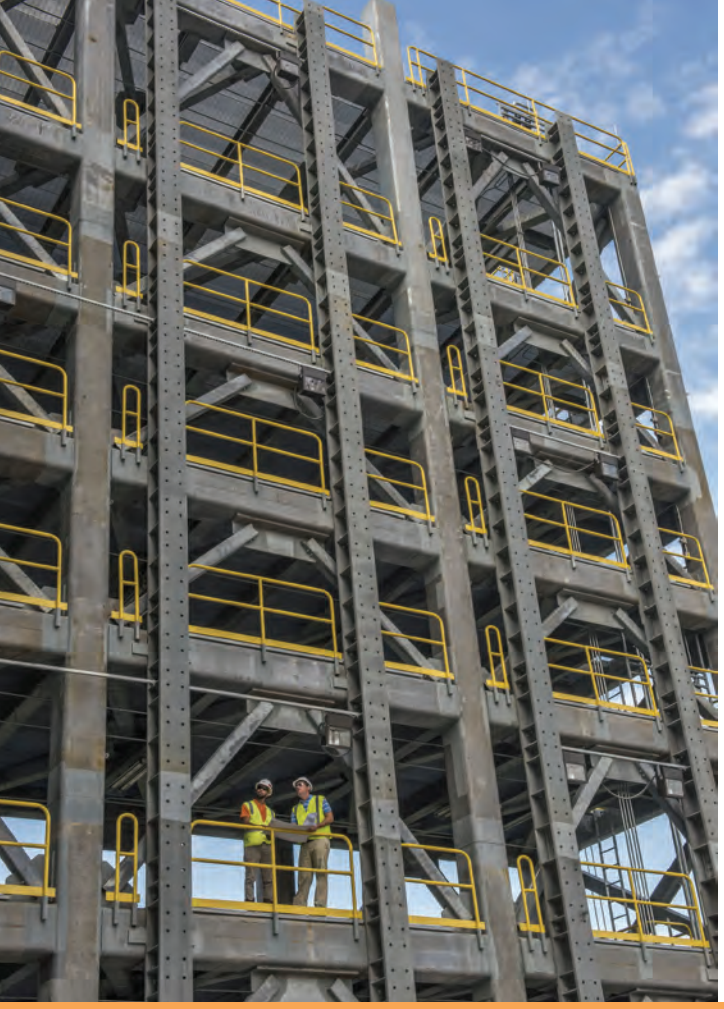
David Osborne, an Aerie Aerospace LLC machinist at NASA's Marshall Space Flight Center in Huntsville, Alabama, takes measurements prior to the start of precision machining of the SLS Orion stage adapter. The adapter will connect the Orion spacecraft to the interim cryogenic propulsion stage (ICPS) for the first flight of SLS with Orion in late 2018. The adapter also will carry 13 CubeSats that will perform science and technology investigations that will help pave the way for future human exploration in deep space, including the Journey to Mars.

The adapter's top surface will be machined completely flat on a seven-axis mill turntable before hundreds of holes are drilled in it for bolting to the rest of the rocket. To complete the same work on the other side of the adapter, the hardware will later be flipped using a Posi-Turner load rotation device and an assembly jig, the ring that connects the Posi-Turner to the bottom of the adapter and rotates it. The adapter will then undergo inspections, and a special coating will be added to the top and bottom of the structure to make it more corrosion resistant.



BOOSTER AFT SKIRT COMPLETES REFURBISHMENT WORK

This is one of the solid rocket booster aft skirts that will fly on EM-1, the first test flight of SLS with NASA's Orion Spacecraft in late 2018 and a key milestone on the NASA's Journey to Mars. The aft skirt was recently moved to NASA's Booster Fabrication Facility (BFF) at NASA's Kennedy Space Center after the refurbishment work was completed at Hangar AF by booster prime contractor Orbital ATK. The aft skirt assembly and testing operations are now in work in order to be prepped for integration into the full booster, which will happen once the booster segments arrive at Kennedy for stacking.



MAJOR CONSTRUCTION COMPLETE ON FIRST OF TWO NEW TEST STANDS FOR SLS

Phil Hendrix, right, and Curtney Walters compare blueprint plans of Structural Test Stand 4697 to the nearly completed structure at NASA's Marshall Space Flight Center in Huntsville, Alabama. While construction of the stand is complete, over the next few months Marshall engineers will install special test equipment to prepare Test Stand 4697 for its first mission; subjecting the 196,000-gallon liquid oxygen tank in the massive SLS core stage to the same stresses and pressures it will endure at launch and in flight. Hendrix is the Marshall Office of Center Operations facilities construction project manager for the stand, and Walters is project engineer with the U.S. Army Corps of Engineers, the contracting partner on the project. **Read the full story at: bit.ly/2dOwYDC**

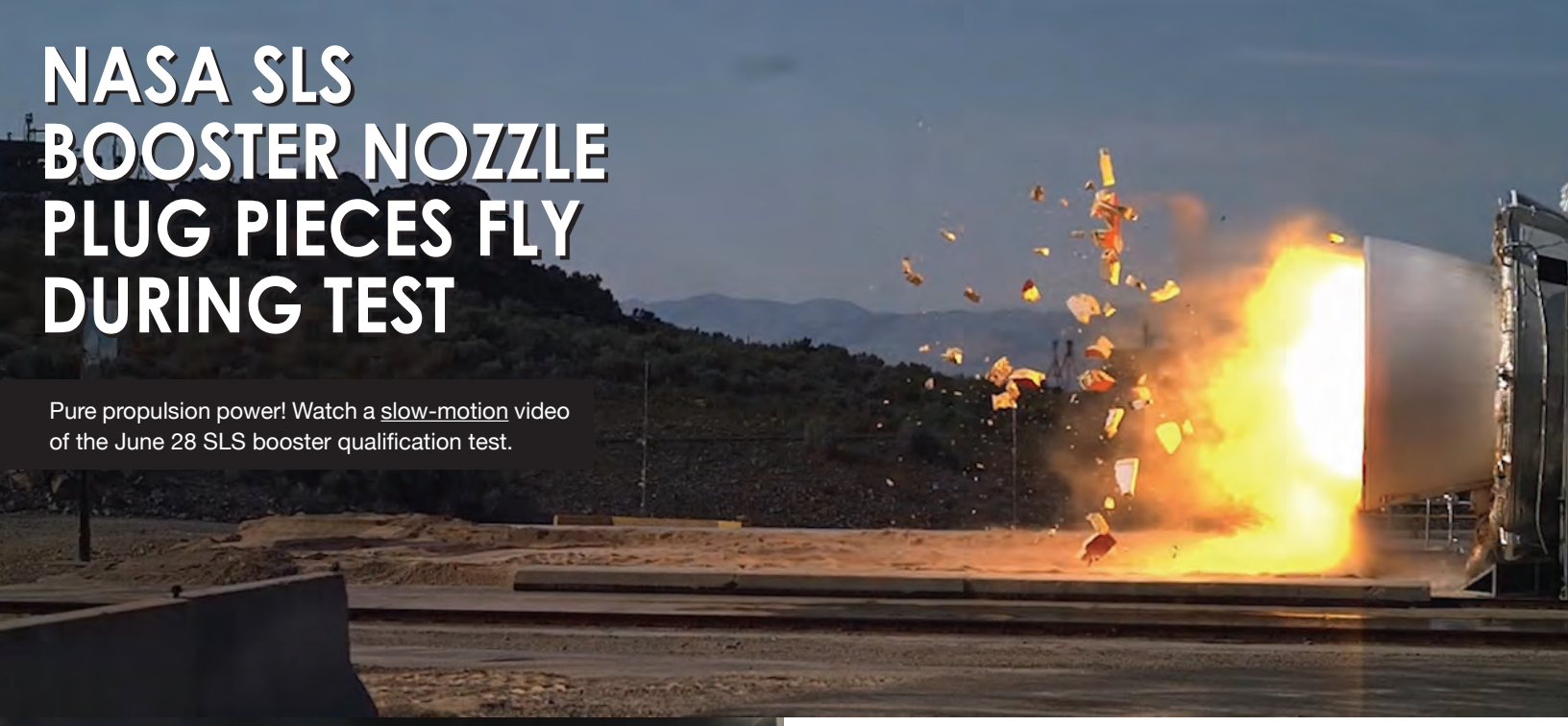
SPACEFLIGHT PARTNERS:
Magna Steyr

LOCATION:
SLS work is done by the company's division in Graz, Austria

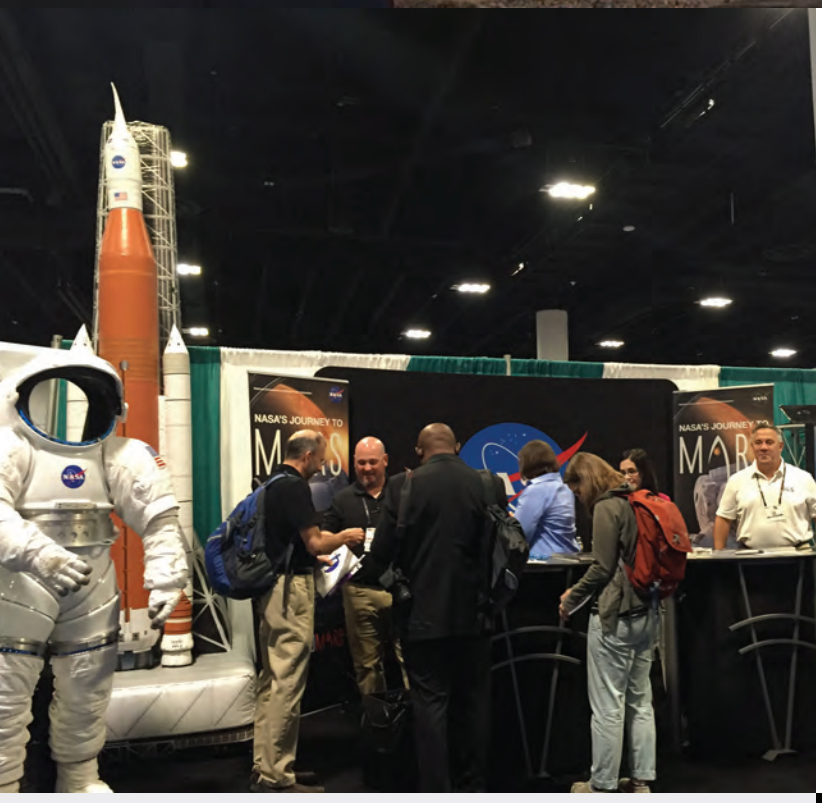
NUMBER OF EMPLOYEES:
124,000 worldwide

WHAT THEY DO FOR SLS:
Magna Aerospace is manufacturing pressurization lines for the SLS core stage.

NASA SLS BOOSTER NOZZLE PLUG PIECES FLY DURING TEST



Pure propulsion power! Watch a slow-motion video of the June 28 SLS booster qualification test.



MUSEUM PROFESSIONALS LEARN MORE ABOUT SLS AND JOURNEY TO MARS

More than 1,800 guests got a chance to see Journey to Mars exhibits and learn more about the world's most powerful rocket Sept. 24-27 at the Association of Science-Technology Centers Conference in Tampa, Florida. The conference is the largest gathering of museum professionals from across the globe.

FOLLOW THE PROGRESS OF NASA'S NEW LAUNCH VEHICLE FOR DEEP SPACE:

NASA SLS Rocketology Blog....blogs.nasa.gov/Rocketology
Twitter.....Twitter.com/NASA_SLS
Facebook.....Facebook.com/NASASLS
Flickr.....Flickr.com/NASASLS
Instagram.....Instagram.com/explorenasa
Tumblr.....nasasls.tumblr.com

COMING IN OCTOBER:

Launch vehicle stage adapter qualification article goes into test stand at Marshall

Booster aft skirt work underway at Kennedy Space Center

Von Braun Symposium